

REMARKS

Overview of the Office Action

Claims 1, 2, 4, 6, 9, and 10 have been rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,005,717 to Neuberger et al. ("Neuberger") in view of U.S. Patent No. 6,950,573 to Ota et al. ("Ota").

Claims 7-8, 11, and 14 have been rejected under 35 U.S.C. §103(a) as unpatentable over Neuberger in view of Ota, and further in view of U.S. Patent No. 6,771,686 to Ullman et al. ("Ullman").

Claims 12 and 13 have been rejected under 35 U.S.C. §103(a) as unpatentable over Neuberger in view of Ota, and further in view of U.S. Patent No. 5,386,431 to Tulip ("Tulip").

Failure to list Ota on form PTO-892

Applicant notes that Examiner has not listed the Ota reference on a PTO-892 form. Applicant requests that Ota be so listed as a reference cited by the Examiner.

Status of the claims

Claim 1 has been amended.

Claim 3 has been previously canceled.

Claim 5 has been previously withdrawn.

Claim 7 has now been canceled.

Claims 13 and 14 were amended to depend from claim 11 for antecedent basis of "the stem".

Claims 1-2, 4, 6, and 8-12 remain pending.

Summary of subject matter disclosed in the specification

The following descriptive details are based on the specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations which are unclaimed.

The coupling-in device couples-in light from a plurality of light sources into an end of an optical waveguide. All of the light is coupled in via a coupling-in area that constitutes a single curved region that covers the entire end of the optical waveguide. The single curved region is curved in a focusing fashion, and the coupling-in device has a plurality of focusing optics for the light from the various light sources. Further, the focusing optics and the coupling-in area are produced in one piece, and the coupling-in area is surrounded by a frame in which the focusing optics are integrated.

An advantage of the disclosed device is that free space exists between the focusing optics and the coupling-in area so that the focusing optics can have an area curved convexly inward in the direction of the coupling-in area and the coupling-in area can be formed in a circle-segment-like or sphere-segment-like configuration in the direction of the focusing optics (see Fig. 1).

Descriptive summary of Neuberger

Neuberger discloses a small, scalable, and inexpensive semiconductor diode laser system. The system includes a diode laser beam combiner that includes a cylindrical microlens, a lens array, and a fan window that optically combines energy outputs of at least two diode laser emitters or emitter groups. The diode laser beam combiner first collimates the diode laser energy and then optically combines the energy along a pre-determined axis, thus limiting effects due to

space between the diode laser emitters. A chosen spot size and shape can be achieved by manipulating the number and size of lens array and fan window steps. Maximum power density and beam brightness available from the diode laser emitters or emitter groups is thus available at a work or treatment site.

Descriptive summary of Ota

Ota discloses optical waveguides, lens arrays, and laser collecting devices. The optical waveguide is formed with an output surface which is made smaller in dimension in a fast axis direction than an input surface. The waveguide collects in the fast axis direction plural laser beams output from plural laser emitting parts arranged in the fast axis direction and outputs from the output surface. The entrance surface of the optical waveguide is provided with first lenses to correspond respectively to the plural laser emitting parts. Each of the first lenses is located to be offset first predetermined distances from a corresponding one of the laser emitting parts in the beam traveling direction and in said fast axis direction, and the first predetermined distances are determined for each of the first lens in taking into account the focal length of each first lens and an angle which each first lens makes with the output surface of the waveguide.

Claims 1, 2, 4, 6, 9, and 10 are allowable over Neuberger and Ota under 35 U.S.C. § 103(a)

The Office Action states that the combination of Neuberger and Ota teaches all of the elements recited in Applicant's claims.

Independent claim 1 has been amended to point out more clearly the subject matter that the Applicants regard as the invention. Specifically, claim 1 has been amended to incorporate the limitations of dependent claim 7 and now recites a coupling-in device for light from a

plurality of light sources into an end of an optical waveguide. All of the light is coupled in via a coupling-in area that constitutes a single curved region that covers the entire end of the optical waveguide. The single curved region is curved in a focusing fashion, and the coupling-in device has a plurality of focusing optics for the light from the various light sources. The focusing optics and the coupling-in area are produced in one single piece, and the coupling-in area is surrounded by a frame in which the focusing optics are integrated. Support for the claim amendment can be found in the now canceled dependent claim 7 and in paragraph 0026 of the published specification.

The Examiner concedes in the Office Action that Neuberger does not teach or suggest a device wherein all of the light is coupled in via a coupling-in area that constitutes a single curved region that cover the entire end of the optical waveguide. Further, and in contrast to Applicants' amended independent claim 1, Neuberger also does not teach or suggest that the focusing optics and the coupling-in area are produced in one piece, and that the coupling-in area is surrounded by a frame in which the focusing optics are integrated.

The Examiner cites Fig. 1 and col. 2, lines 32-40 of Ota as teaching a device wherein all of the light is coupled in via a coupling-in area that constitutes a single curved region that cover the entire end of the optical waveguide. However, Ota does not teach or suggest that the focusing optics and the coupling-in area are produced in one piece, and that the coupling-in area is surrounded by a frame in which the focusing optics are integrated, as now recited in Applicants' amended independent claim 1.

Further, the lens array disclosed by Neuberger collimates along the slow axis and the lens disclosed by Ota collects light beams in the slow axis direction. As the lens array of Neuberger and the lens of Ota both have the same optical function, there is no motivation to combine the

references as no advantage is achieved. Moreover, combining the references does not result a device where the coupling-in area is surrounded by a frame in which the focusing optics are integrated, as recited in Applicants' amended independent claim 1. Instead, combining the devices of Neuberger and Ota would result in forming the curve shaped end of the fiber below 405 (see Neuberger Fig. 4b) as a single curved region, which would be a single large element.

The Examiner cites Ullman as teaching the subject matter of dependent claim 7, which has been incorporated into Applicants' amended independent claim 1. Ullman discloses a laser diode arrangement that includes diode laser bars with emitters, correction optics, and a focusing lens (see Fig. 13 of Ullman). The individual emitters deliver a laser beam, which has divergence, both in the fast axis and in the slow axis. To eliminate this beam divergence, Ullman teaches using a correction optics segment that includes several individual lenses. A cylinder lens surface on the entry surface of each individual lens is active in the fast axis and a cylinder lens surface on the exit surface of each individual lens is active in the slow axis.

The Examiner specifically cites col. 2, lines 40-52 of Ullman as teaching that the focusing optics and the coupling-in area are produced in one piece. However, this section of Ullman cited by the Examiner states only that correction optics for fast axis and slow axis collimators may be made as a single lens body. Although Ullman describes correction optics with two optical elements produced in one piece, Ullman does not teach or suggest that the focusing lens, which is analogous to the focusing element in Applicants' recited invention, can be produced in one piece with other optical elements, as recited in Applicants' amended independent claim 1. Furthermore, Ullman does not teach or suggest that the correction optics or parts of the correction optics or the focusing lens are integrated into a frame surrounding another optical element, also as recited in

Applicants' amended independent claim 1 (i.e., the coupling-in area being surrounded by a frame in which the focusing optics are integrated).

In view of the foregoing, it is respectfully submitted that Neuberger, Ota, and Ullman, whether taken alone or in combination, do not teach or suggest the subject matter recited in Applicant's amended independent claim 1. Accordingly, claim 1 is patentable thereover under 35 U.S.C. §103(a).

Dependent claims

Claims 2, 4, 6, 9, and 10, which depend directly or indirectly from independent claim 1, incorporate all of the limitations of independent claim 1 and are, therefore, deemed to be patentably distinct over Neuberger, Ota, and Ullman for at least those reasons discussed above with respect to independent claim 1.

Claims 7-8, 11, and 14 are allowable over Neuberger, Ota, and Ullman under 35 U.S.C. § 103(a)

The Office Action states that the combination of Neuberger, Ota, and Ullman teaches all of the elements recited in Applicant's claims.

Neuberger and Ota have been previously discussed and do not teach or suggest the invention recited in Applicant's amended independent claim 1.

Because Neuberger and Ota do not teach or suggest the subject matter recited in Applicant's amended independent claim 1, and because Ullman does not teach or suggest any elements of the independent claims that Neuberger and Ota are missing, the addition of Ullman to the reference combination fails to remedy the non-obviousness of the claims.

Claim 7 has been canceled. Claims 8, 11, and 14, which depend directly or indirectly from amended independent claim 1, incorporate all of the limitations of amended independent claim 1 and are therefore deemed to be patentably distinct over the combination of Neuberger, Ota, and Ullman for at least those reasons discussed above for independent claim 1.

Claims 12 and 13 are allowable over Neuberger, Ota, and Tulip under 35 U.S.C. § 103(a)

The Office Action states that the combination of Neuberger, Ota, and Tulip teaches all of the elements recited in Applicant's claims.

Neuberger and Ota have been previously discussed and do not teach or suggest the invention recited in Applicant's amended independent claim 1.

Because Neuberger and Ota do not teach or suggest the subject matter recited in Applicant's amended independent claim 1, and because Tulip does not teach or suggest any elements of the independent claims that Neuberger and Ota are missing, the addition of Tulip to the reference combination fails to remedy the non-obviousness of the claims.

Claims 12 and 13, which depend directly or indirectly from amended independent claim 1, incorporate all of the limitations of amended independent claim 1 and are therefore deemed to be patentably distinct over the combination of Neuberger, Ota, and Tulip for at least those reasons discussed above for independent claim 1.

Conclusion

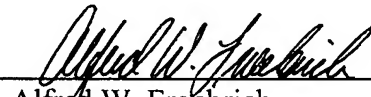
In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of all rejections, and allowance of all pending claims in due course.

Should the Examiner have any comments, questions, suggestions, or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,

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